WE CLAIM:

1. A method of continuously modifying an elongated substrate with multiple modifying agents comprising:

providing a first processing chamber configured for applying a first modifying agent to the elongated substrate, the first processing chamber comprising a first region, a second region, and a constricted medial region between the first region and the second region and configuring the first processing chamber to accept a first treatment mixture into the constricted medial region during continuous movement of the continuous substrate through the first processing chamber;

providing a first treatment mixture comprising the first modifying agent in a first carrier medium, the first carrier medium being selected from the group consisting of a supercritical fluid, a near-critical fluid, a superheated fluid, a superheated liquid, and a liquified gas, such that the first modifying agent separates from the first carrier medium upon a pressure drop when the first treatment mixture is introduced into the constricted medial region;

applying the first modifying agent to the continuous substrate;

providing a second processing chamber configured for applying a second modifying agent to the continuous substrate after the first modifying agent is applied to the continuous substrate;

applying the second modifying agent to the continuous substrate after the first modifying agent is applied to the continuous substrate;

providing a first end seal disposed adjacent to the first processing chamber configured for substantially isolating fluids present in the first processing chamber from the surrounding atmosphere;

providing a second end seal disposed adjacent to the second processing chamber configured for substantially isolating fluids present in the second processing chamber from the surrounding atmosphere;

providing a passageway configured for allowing continuous passage of the continuous substrate through the first end seal, the first processing chamber, the second processing chamber, and the second end seal in series; and

continuously passing the continuous substrate through the passageway.

2. The method of claim 1, further comprising providing a first interstitial seal disposed between the first processing chamber and the second processing chamber, configured for keeping fluids present in each of the processing chambers substantially separate.

3. The method of claim 2, further comprising providing at least one expansion chamber disposed between the first end seal and the first processing chamber, and further comprising providing at least one expansion chamber disposed between the first processing chamber and the first interstitial seal.

4. The method of claim 3, further comprising providing at least one expansion chamber disposed between the second end seal and the second processing chamber, and further comprising providing at least one expansion chamber disposed between the second processing chamber and the first interstitial seal.

5. The method of claim 2, further comprising providing a second interstitial seal and a third processing chamber disposed between the second processing chamber and the second end seal.

6. The method of claim 5, further comprising providing a third interstitial seal and a fourth processing chamber disposed between the third processing chamber and the second end seal.

7. The method of claim 2, wherein the first processing chamber and the second processing chamber are independently selected from the group consisting of venturi chambers, contacting chambers, impregnation chambers, cleaning chambers, chemical reaction chambers, absorption chambers, adsorption chambers, and desorption chambers.

8. The method of claim 1, further comprising:

providing the second processing chamber with a first region, a second region, and a constricted medial region between the first region and the second region;

configuring the provided second processing chamber to accept a second treatment mixture into the constricted medial region of the second processing chamber during continuous movement of the continuous substrate through the second processing chamber; and

providing a second treatment mixture comprising the second modifying agent in a second carrier medium being selected from the group consisting of a supercritical fluid, a near-critical fluid, a superheated fluid, a superheated liquid, and a liquified gas, and wherein the second modifying agent separates from the second carrier medium upon a pressure drop when the second treatment mixture is introduced into the constricted medial region of the second processing chamber upon applying the second modifying agent to the continuous substrate.

9. The method of claim 1, further comprising configuring the passageway such that the continuous substrate is capable of being passed through the passageway co-currently and passing the continuous substrate through the passageway co-currently.

10. The method of claim 1, further comprising configuring the passageway such that the continuous substrate is capable of being passed through the passageway counter-currently and passing the continuous substrate through the passageway counter-currently.

11. The method of claim 2, further comprising configuring the processing chamber to utilize a second treatment mixture comprising the second modifying agent and a second carrier for applying the second modifying agent, and wherein the second carrier is selected from the group consisting of supercritical fluid, near-critical fluid, superheated fluid, superheated liquid, and liquefied gas.

12. The method of claim 12, further comprising providing an injector configured for injecting the second treatment mixture into the second processing chamber and injecting the second treatment mixture into the second processing chamber.

13. The method of claim 12, further comprising providing the second processing chamber with an enlarged first region, an enlarged second region, and a constricted medial region between the first region and the second region.

14. The method of claim 12, further comprising tangentially angling the injector toward the constricted medial region of the second processing chamber.

15. The method of claim 12, further comprising directing the injector essentially perpendicular to the passageway in the second processing chamber.

16. The method of claim 15, further comprising positioning the injector in close proximity to the passageway such that the injector can impregnate the continuous substrate with a high pressure injection of the second treatment mixture.

17. A method for for applying multiple modifying agents to a continuous substrate, substantially isolated from a surrounding atmosphere, comprising:

providing a first processing chamber configured for applying a first modifying agent to the continuous substrate;

providing a second processing chamber configured for applying a second modifying agent to the continuous substrate after the first modifying agent is applied to the continuous substrate;

fluidly coupling the first processing chamber and the second processing chamber to a corresponding collection chamber configured for removing unused modifying agent from at least one processing chamber;

providing a first end seal disposed adjacent to the first processing chamber configured for substantially isolating fluids present in the first processing chamber from the surrounding atmosphere;

providing a second end seal disposed adjacent to the second processing chamber configured for substantially isolating fluids present in the second processing chamber from the

surrounding atmosphere;

disposing a first interstitial seal, configured for keeping fluids present in each of the processing chambers substantially separate, between the first processing chamber and the second processing chamber;

providing a passageway configured for allowing continuous passage of the continuous substrate through the first end seal, the first processing chamber, the second processing chamber, and the second end seal in series.

18. The method of claim 17, further comprising fluidly coupling the first processing chamber to a first collection chamber and fluidly coupling the second processing chamber to the second collection chamber.

19. The method of claim 17, further comprising providing at least one expansion chamber which is fluidly disposed between the at least one collection chamber and the corresponding processing chamber.